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the depth and comprehensiveness of an exhaustive treatise, nor should an elaborate work on original investigation be supposed to cover the details of elementary science.

The present book is intended to serve as an introduction to the elements of phytotomy. This purpose is effected more than ordinarily well. It is no mean task to distinguish between the relevant and the irrelevant, between the essential and the non-essential in the construction of an elementary text. In these very points, the author has been particularly happy, and deserves congratulation upon the coherency and the coordination manifested in the text.

A striking feature of the book is its prevailing clearness. Many otherwise well written and helpful text-books are marred by the fact that too much is written between the lines, a thing deplorable in any scientific writing, but especially so in an elementary one. The author has succeeded, however, not only in establishing delightful perspicacity of style, but also in maintaining it throughout the work. In consequence, the beginner may find here a text which presents in a remarkably easily assimilated condition those rudiments of plant anatomy which should serve as a foundation for advanced botanical study in all lines.

The merits of the book are many and obvious, and warrant passing its few defects in silence. Its inspiration is readily recognizable as of the German school, an additional point in its favor were it not for a prefatory remark to which the reviewer must enter serious objection. The author states that "it is quite certain that the measure of our progress in any science may be found in our ability to adapt the thought and experience of other nations to our special needs and resources," a statement of such a very peculiar nature that comment is superfluous.

The book is divided into two parts, the first of which treats of cytology, or, as the author terms it, the anatomy of the cell. Under this, the first chapter treats of the cell as a unit, the second and third present the subjects of cell-wall and cell-contents in their modern aspects. The second part discusses the anatomy of tissues, first generally, and then more specially, with reference to the thoroughly antiquated divisions, Thallophytes and Cormophytes. The last chapter, the irrelevancy of which is excused by its importance, is devoted to an exposition of the secondary growth of stems and roots.—FREDERIC E. CLEMENTS.

### **Boulenger's Catalogue of Snakes in the British Museum.<sup>1</sup>**

—In this work we have a manual of Ophiology in which the subject is

<sup>1</sup> Catalogue of the Snakes in the British Museum. Vol. I, 1893; vol. II, 1894; vol. III, 1896. By G. A. Boulenger, F. R. S.

as nearly as possible brought up to date. The especial advantage of being the work of the Keeper of the largest collection of Ophidians in the world, makes this catalogue of especial value to all students. The author informs us that there are known 1639 species of snakes, of which 1327 are represented in the collection of the British Museum by 11092 specimens.

A good deal of valuable new osteological work enters into the systematic, which will be at once recognized by specialists. Thus the determination of the forms which have elongate hypapophyses throughout the vertebral column is here made for the first time, and the discovery that all the Colubridæ of Madagascar have the prolonged series of hypapophyses, is one of the notable announcements of the work. The peculiar pterygoids of the Amblycephalidæ are the author's discovery, as are also the split ectopterygoids of *Dispholidus*, etc., and the confluent optic foramina of the *Psammophiinae*<sup>2</sup>. The labor of specific determination of over 11000 specimens, in an order where variation is often conspicuous, is, however, the great feature of such a work as this, and even the approximately complete form in which it is now presented, is a monument to the industry and acumen of its author, and a service rendered to science by the British Museum which will always remain.

There are, however, some spots on the face of this illuminating ing production. The labor of determining the true limits of variable species has in a good many instances, it seems to us, proven too much for the patience of the author, and he has resorted to the convenient method of "lumping" too often. He has given up a valuable feature of the older catalogues, the list of doubtful species. In the present work all published species are either good or bad, whether the author has had the requisite opportunity of determining their true status or not. Thus it has happened in not a few instances that names relegated to the synonymy in the body of the work are reintroduced in the Addenda as belonging to good species. Had the author the material it is probable that a good many others would have been recognized before the final issue of the Catalogue. The author has been especially unfortunate in his treatment of North American species, and the student of North American Ophiology will not find his knowledge of this subject increased by this publication. Some of the species studies are on the other hand very thorough, as for instance the genera *Vipera* and *Naja*. The revision of the synonymy of both the older and later European authors is a service for which all herpetologists will be grateful.

<sup>2</sup> I mention here that the genera *Malpolum*, *Psammophis*, *Mimophis* and *Rhamphiophis* have no protrusible male intromittent organ. For this reason I propose to arrange them as a special subfamily, the *Psammophiinae*.

The primary divisions of the Ophidia (or Serpentes as they should be called) adopted, are nine families, which have very different values. These can be associated in superfamilies of approximately equal value, but this Dr. Boulenger has not done, but has contented himself with giving an analytical table (pp. 1-2), where some of the characters of these superfamilies are pointed out, in the dichotomous order, which does not express relative value. Many groups usually regarded as families are not recognized, as for instance the Najidæ and Dipsadidæ, which are included in the Colubridæ. In a phylogenetic table the interesting suggestion is made that the Solenoglyphous snakes are derived from the Opisthoglyphous, and not from the Proteroglyphous.

In seeking for generic characters the dentition has been closely examined. The value of dental characters has been thoroughly tested, and the result is valuable to the student, although we do not always agree with the use made of the information in the Catalogue. The author does not adopt the characters used by Duméril and Bibron in many instances, for good reasons, but he introduces others of his own which are no better, as the numbers and in some cases the relative lengths of the teeth. In practice it is often impossible to determine whether teeth are of equal length or a little longer at one or the other end of the jaw; nor is the number of the teeth in the jaws precisely definitive of anything but species, as can be readily seen from the results recorded in the present work. The division or union of the anal plate and urosteges, is generally rejected as a character, although its value is testified to by the uniform use made of it by ophiologists. In fact the generic definitions are based on no uniform principle, and the author seems to have been possessed at times with the idea that it were an especial merit to differ as much as possible from his predecessors.

One result of the study of this work will be to prove to ophiologists that it is desirable to become acquainted with new characters of definitive value before we can have the true system of the snakes. An important addition to our knowledge in this direction, i. e. of the characters of the hemipenis and of the lungs, came too late to be incorporated in the present work.—E. D. COPE.

**Nuttall's Handbook of Birds.**<sup>1</sup>—A new edition, with important additions, and a series of more than one hundred colored illustrations.

<sup>1</sup> *A Popular Handbook of the Ornithology of Eastern North America.*—By Thomas Nuttall. Revised and annotated by Montague Chamberlain. Vol. I, *Land Birds*. Vol. II *Game and Water Birds*. Second edition, with corrections and additions. Illustrated with one hundred and seventy-two figures, two colored